KOOTENAI HIGH SCHOOL DISTRICT 274 (PWS 1280107)
SOURCE WATER ASSESSMENT REPORT

December 6, 2000

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

This report, *Source Water Assessment for Kootenai High School District 274 (1280107)*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The Kootenai High School District 274 drinking water system consists of one well. The well has a history of water samples positive for total coliform bacteria. Indeed, several microbial sources are located close to the well, and may become sources of contamination at some point. The school has attempted to identify the source of contamination and is considering adding a disinfection component to the system. The school provides an alternative source of drinking water to its consumers when necessary.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

Kootenai High School District 274 should focus source water protection activities on implementation of practices aimed at reducing the possibility of microbial contamination of the well. Most of the designated source water area is outside the direct jurisdiction of Kootenai High School District 274. Partnerships with state and local agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies, please contact your regional Idaho Department of Environmental Quality office or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR KOOTENAI HIGH SCHOOL DISTRICT 274

Section 1. Introduction- Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of this assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

Kootenai High School District 274 serves a population of approximately 350 students and staff. The public drinking water system for Kootenai High School District 274 is comprised of one well. The well is located just south of Highway 97, ½mile west of Highway 3. (Figure 1).

In recent years the Kootenai High School District 274 well has produced occasional water samples positive for total coliform bacteria. The system operator has taken the necessary steps to notify the public of these positive samples and has followed through with repeat sampling, which has proved negative at this time. The school is attempting to identify the source of this bacteria. In 1993 the chemical tetrachloroethylene, a leachate of PVC pipes and a discharge of factories and dry cleaners, was detected in a water sample taken from the well at 0.40000Φg/L, well below the Maximum Contaminant Level of 5.0Φg/L. There have been no detections of tetrachloroethylene since the initial detection.

Defining the Zones of Contribution- Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time of travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ used a refined computer model approved by the EPA in determining the three-year (Zone 1B), six-year (Zone 2), and ten-year (Zone 3) times-of-travel (TOT) for water associated with the Silver Valley hydrogeologic unit in the vicinity of Harrison, Idaho. The computer model used site specific data, assimilated by DEQ from a variety of sources including local well logs. The delineated source water assessment area for Kootenai High School District 274 can best be described as a fan-shape extending from the wellhead in a southeasterly direction. The actual data used by DEQ in determining the source water assessment delineation areas are available upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

The dominant land use in the area surrounding the Kootenai High School District 274 drinking water well is undeveloped.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at

the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted during the spring of 2000. The first phase involved identifying and documenting potential contaminant sources within the Kootenai High School District 274 source water assessment area through the use of computer databases and Geographic Information System maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory is voluntary and was not completed by Kootenai High School District 274.

A total of five potential contaminant sites are located within the delineated source water area. Two of the potential contaminant sources are located at the intersection of Highways 3 and 97, the third is located just northwest of the school building. Potential contaminant sources located in the delineated source water area include a wastewater land application site, an underground fuel storage tank and a leaking underground fuel storage tank. Fourth and fifth potential contaminant sites were identified by IDEQ staff during review of Kootenai High School District 274's PWS file for completion of this report and were added by IDEQ to the potential contaminant inventory as enhanced contaminant inventory sites. Table 1 lists the potential contaminants of concern, time of travel zones, and information source.

Figure 1. Kootenai High School District 274 Delineation Location and Potential Contaminant Inventory

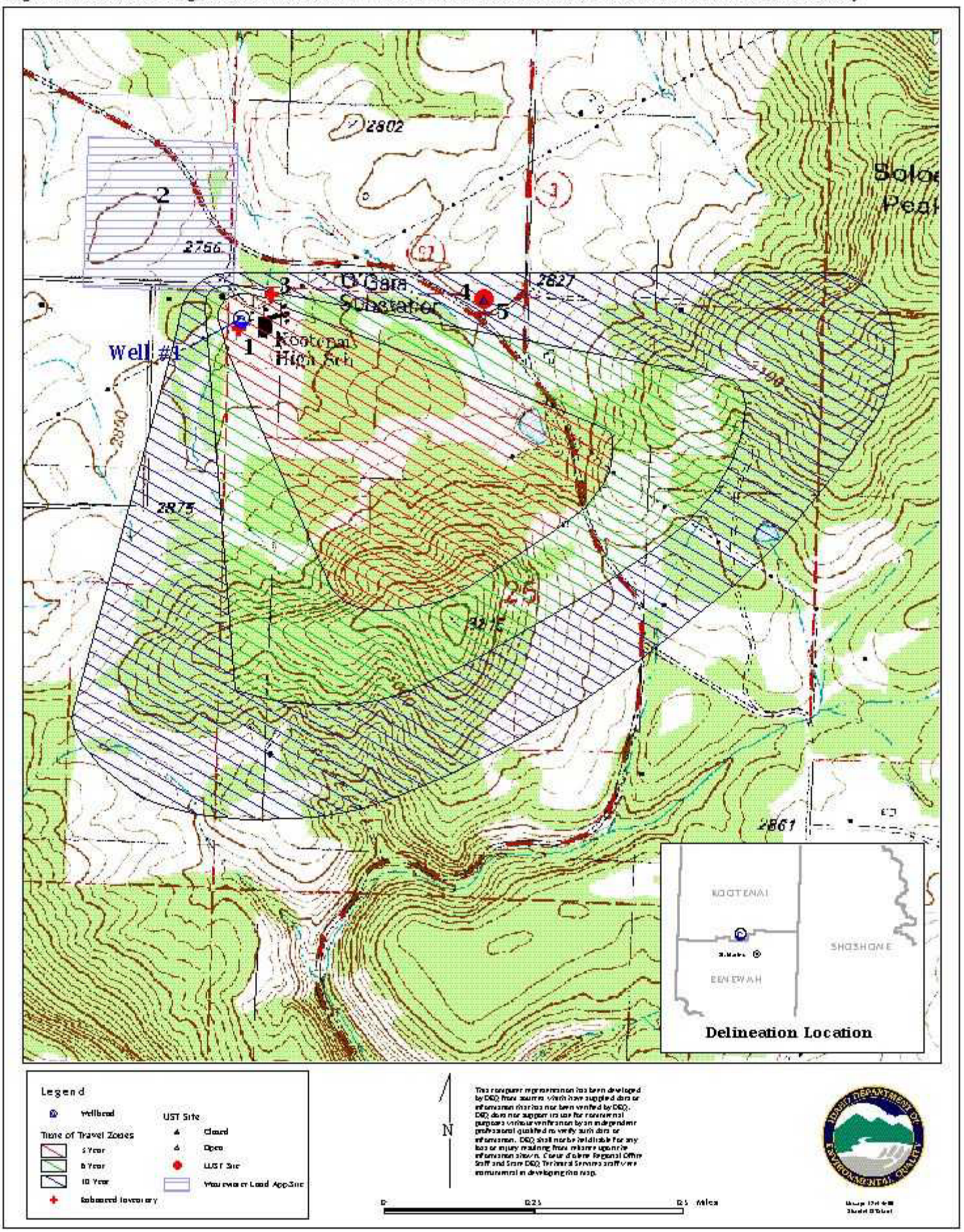

Table 1. Kootenai High School District 274 Potential Contaminant Inventory

SITE #	Source Description[1]	TOT Zone[2] (years)	Source of Information	Potential Contaminants[3]
1	Dug Well	3	Enhanced Inventory	Microbial
2	WLAP	6 and 10	Database Search	Microbial
3	Lagoon	6	Enhanced Inventory	Microbial
4	LUST	10	Database Search	VOC, SOC
5	UST	10	Database Search	VOC, SOC

[1] UST = underground storage tank, LUST = leaking underground fuel storage tank, WLAP = wastewater land application site
[2] TOT = time of travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 3. Susceptibility Analysis

The susceptibility of the source to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The well's hydrologic sensitivity is moderate. This reflects the lack of documentation of significant clay layers retarding the vertical transport of contaminants and the shallow nature of the aquifer. This score may be decreased with information provided in the form of a well log that gives evidence of a protective clay layer over the aquifer.

Well Construction

Well construction directly affects the ability of the wells to protect the aquifer from contaminants. Lower scores imply a system that can better protect the water. The Kootenai High School District 274 drinking water system consists of one well that extracts ground water for domestic use. The well system construction score was moderate, mostly due to the lack of information about the well's construction. Again, information in the form of a well log may decrease this score by verifying favorable geologic conditions in the immediate area.

Potential Contaminant Source and Land Use

The well rated in the low category for the inorganic chemical class, volatile organic chemical class, synthetic organic chemical class and microbial class. The potential contaminant source/land use score for the microbial class was slightly higher than the scores for other classes due to the presence of three potential sources of microbial contamination near the well. The first of these sources is a stream located approximately 20' from the well, the second is a dug well located approximately 80' south of the well and the third microbial source is

a lagoon located in front of the school building. The dug well and lagoon were identified by IDEQ staff during review of Kootenai High School District 274's PWS file for completion of this report and were added to the potential contaminant inventory as enhanced contaminant inventory sites. If the well were to be abandoned in accordance with Idaho Department of Water Resources guidelines it could be removed from the list of potential contaminant sources for Kootenai High School District 274.

Final Susceptibility Ranking

In terms of the total susceptibility score, it can be seen from Table 2 that the well showed a moderate susceptibility for inorganic chemicals, volatile organic chemicals, synthetic organic chemicals and microbials.

Table 2. Summary of Kootenai High School District 274 Susceptibility Evaluation

	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
Well		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
1	M	L	L	L	L	M	M	M	M	M

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
[2]H* - Indicates source automatically scored as highly susceptible due to presence of either a VOC, SOC or an IOC above the Maximum Contaminant Level in the tested drinking water

Susceptibility Summary

The Kootenai High School drinking water system is considered susceptible to microbial contamination due to the presence of multiple sources of microbes in the vicinity of the well. This susceptibility determination may change if a well driller's log that provides more complete information becomes available.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.
An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. Kootenai High School District 274 should focus source water protection activities on implementation of practices aimed at reducing the chances of microbial contamination of the drinking water well. Kootenai High

School District 274 may want to investigate the possibility of having the open dug well located near the drinking water well sealed in accordance with Idaho Department of Water Resources guidelines. They should also continue best management practices in terms of the lagoon and wastewater land application site near the school, possibly attempting to educate neighbors of these practices. These actions would significantly decrease the possibility of microbial contamination of the drinking water well. In the case of the surface water flowing near the well, partnerships with state and local agencies and industry groups should be established and are critical to success, as these entities participate in or regulate activities that may affect the surface water. Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term.

Assistance

Public water supplies and others may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Coeur d'Alene Regional IDEQ Office (208) 769-1422

State IDEQ Office (208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with wellhead protection strategies.

References Cited

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Attachment A

Kootenai High School Susceptibility Analysis Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

> 13 High Susceptibility

Ground Water Susceptibility Report Public Water System Name : KOOTENAI HIGH SCHOOL DIST 274 Well: WELL #1

Public Water System Number 1280107 10/26/00 9:22:33 AM

1. System Construction		SCORE				
Drill Date	11/11/1111					
Driller Log Available	NO					
Sanitary Survey (if yes, indicate date of last survey)	YES	1999				
Well meets IDWR construction standards	NO	1				
Wellhead and surface seal maintained	YES	0				
Casing and annular seal extend to low permeability unit	NO	2				
Highest production 100 feet below static water level	NO	1				
Well located outside the 100 year flood plain	YES	0				
Total System Construction Score		4				
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained	YES	0				
Vadose zone composed of gravel, fractured rock or unknown	YES	1				
Depth to first water > 300 feet	NO	1				
Aquitard present with > 50 feet cumulative thickness	NO	2				
Total Hydrologic Score		4				
3. Potential Contaminant / Land Use - ZONE 1A			IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT		0	0	0	0
Farm chemical use high	NO		0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES		NO	YES	NO	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A			0	0	0	0
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)	YES		0	0	0	3
(Score = # Sources X 2) 8 Points Maximum			0	0	0	6
Sources of Class II or III leachable contaminants or	YES		0	0	0	
4 Points Maximum			0	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO		0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land		0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B			0	0	0	6
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present	YES		0	0	0	
Sources of Class II or III leachable contaminants or	NO		0	0	0	
Land Use Zone II	Less than 25% Agricultural Land		0	0	0	
Potential Contaminant Source / Land Use Score - Zone II			0	0	0	0
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present	YES		0	1	1	
Sources of Class II or III leachable contaminants or	YES		0	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO		0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III			0	2	2	0
Cumulative Potential Contaminant / Land Use Score			0	2	2	6
4. Final Susceptibility Source Score			8	8	8	10
5. Final Well Ranking			Moderate	Moderate	High	High

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund@ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.